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ABSTRACT

Type A behavior is an aggregate of behaviors associated with increased risk of coronary heart disease. Two self-administered questionnaires used to determine the presence of Type A behavior, the Jenkins Activity Survey and Framingham Type A Behavior Pattern Scale, were administered to 150 undergraduate students at a midwestern university, along with a Six-item Questionnaire. The purpose of the research was to determine the latter's validity. Data collected on 136 students were analyzed and revealed that the Six-item Questionnaire correlated positiviely and significantly with the Jenkins Activity Survey and the Framingham (all correlations were below 0.60). Correlations for females between the Questionnaire and the Jenkins and Framingham were generally higher than those for males, although discriminant analyses indicated overall differences were not significant. While there is a great deal of variance not accounted for with the Six-item Questionnaire, it may still be useful as a gross indicator of Type A behavior. (Author)

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Validation of a Six Item Questionnaire For Assessing Type A Behavior

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Abstract

Type A behavior is an aggregate of behaviors associated with increased risk of coronary heart disease. Two self-administered questionnaires used to determine the presence of Type A behavior, the Jenkins Activity Survey and Framingham Type A Behavior Pattern Scale, were administered to 150 undergraduate students at a midwestern university, along with a Six-item Questionnaire. The purpose of the research was to determine the latter's validity. Data collected on 136 students were analyzed and revealed the Six-item Questionnaire correlated positively and significantly with the Jenkins Activity Survey and the Framingham (all correlations were below 0.60). Correlations for females between the Questionnaire and the Jenkins and Framingham were generally higher than for males, although discriminant analyses indicated overall differences were not significant. While there is a great deal of variance not accounted for with the Six-item Questionnaire, it may still be useful as a gross indicator of Type A behavior.

INTRODUCTION

Coronary heart disease is frequently thought of as a relatively new phenomena, the product of modern day society in an industrialized world. Indeed, it is the leading cause of death in the United States, with 959,000 persons dying from heart and blood vessel disease in 1977 (Hales, 1979). While researchers in the field agree to the seriousness of the disease, many disagree as to its cause(s), treatment and prevention. During the past two decades, considerable research has been conducted to investigate the role psychological, socioeconomic and behavioral, as well as physiological, components have in the development of coronary heart disease. The pioneering work of Friedman and Rosenman with their theory of a Type A behavior pattern is frequently cited for its contribution to the understanding of this disease (Herman, Blumenthal, Black & Chesney, 1981; Sparacino, 1979). Prior to their work, diet and especially dietary cholesterol were believed to be the major contributors to the development of heart disease.

In the late 1950s, while researching medical literature in preparation for writing an article on the role dietary cholesterol had in coronary heart disease, Friedman and Rosenman discovered that well executed studies suggested diet alone could not account for the development of heart disease (Friedman & Rosenman, 1974). After

surveying the eating habits of volunteers from the San Francisco Junior League and their husbands, Friedman and Rosenman found that although the wives' dietary intake was the same as their husbands', they had a lower incidence of coronary heart disease.

In an effort to determine why men had a higher incidence of heart disease than women, Friedman and Rosenman sent questionnaires to 150 San Francisco businessmen asking them to check which habits, from a list of ten, they felt preceded a heart attack in a friend of theirs. Seventy percent checked they felt "excessive competitive drive and meeting deadlines" were the outstanding characteristics. In addition, the questionnaire was sent to 100 internists who treated coronary patients. The majority of internists also indicated they felt excessive competitive drive and meeting deadlines were the leading cause in their coronary patients. From this research, Friedman and Rosenman began to formulate their theory of a behavior pattern which they termed "Type A."

In their book, Type A Behavior and Your Heart (1974), Friedman and Rosenman defined Type A behavior as an "action-emotion complex" exhibited by individuals who are engaged in a "relatively chronic struggle to obtain an unlimited number of poorly defined things from their environment in the shortest period of time." They further state that "whatever else this pattern might encompass in its entirety, whenever any person felt within himself a chronic sense of time urgency and also exhibited excessive competitive drive, he invariably possessed the Type A Behavior Pattern."

In 1960 to 1961, Friedman and Rosenman, along with several other researchers, began a prospective study into the etiology of coronary heart disease and to test their theory of Type A behavior (Rosenman, Friedman, Straus, Wurm, Kositchek, Hahn & Werthessen, 1964). The study, known as the Western Collaborative Group Study (WCGS) involved over 3500 men employed in 11 corporations in the San Francisco-Oakland Bay area and Los Angeles area, between the ages of 39 to 59. Relevant histories including medical and socioeconomic data were obtained from each participant. In addition, various physiological tests as well as a Structured Interview were conducted.

Structured Interview

The Structured Interview (SI) was specifically designed to elicit the characteristics of Type A behavior as defined by Friedman and Rosenman, and was administered by trained interviewers. Thus, in addition to content, attention was paid to the behavioral mannerisms and speech styles of the participants exhibited during the SI. Type A behavior was defined as an overt exhibition of intense striving for achievement, easily provoked hostility, impatience, vigorous speech and abruptness of gestures, in addition to excessive competitive drive and a chronic sense of time urgency. As some individuals exhibited the Type A pattern in a more developed form than others, subjects were classified as exhibiting fully developed (A-1) or less developed (A-2) Type A behavior. Subjects exhibiting the converse of Type A behavior were classified as either fully developed (B-4) or less developed (B-3).

The SI proved to be both valid and reliable in assessing Type A behavior during the 8½ year follow-up period of the WCGS study (Dembroski, Weiss, Shields, Haynes & Feinleib, 1978; Glass, 1977; Jenkins, Zyzanski & Rosenman, 1971). Because the SI required approximately 20 minutes per person to conduct by a trained interviewer whose training might take from one week to one month to complete, a simple, more efficient method for assessing Type A behavior was sought.

Jenkins Activity Survey

The Jenkins Activity Survey (JAS) was developed in 1964 as a self-administered, computer scored, objective technique for measuring Type A behavior in an effort to duplicate the results of the SI (Jenkins, Rosenman & Friedman, 1967). It consisted of 64 items, some of which were derived from the SI questions. Each item was presented as an initial statement or query followed by 2 to 5 alternative responses and the subject indicated which response was true of him for each statement.

The item pool was administered in 1964 to over 100 men in the WCGS who had previously been classified as Type A or B by the SI technique (Jenkins et al., 1967; Jenkins, 1978). Forty of these items were found to successfully discriminate Type As from Type Bs and were retained. Twenty-one new items were added to be validated, which comprised the first published edition of the JAS (Jenkins et al., 1967; Jenkins, Rosenman & Zyzanski, 1974; Zyzanski & Jenkins, 1970).

In 1965 this 61-item questionnaire was administered to the entire WCGS population with over 92 percent of the completed questionnaires being returned. (Articles by Jenkins, Rosenman & Friedman, 1967; Jenkins, Rosenman & Zyzanski, 1974; and Zyzanski & Jenkins, 1970 refer to the 1965 first edition of the Jenkins Activity Survey as containing 61 items. However, in Chapter 5 titled "A Comparative Review of the Interview and Questionnaire Methods in the Assessment of the Coronary-Prone Behavior Pattern" in the book, Coronary Prone Behavior, by Dembroski, Weiss, Shields, Haynes & Feinleib [1978], Jenkins refers to the first edition of the JAS, which appeared in 1965, as a 62 item instrument.) Of the questionnaires returned during the first six months of 1965, all those persons who received identical Behavior Type ratings both at intake and in 1962 on the SI, along the four point scale, were selected for three criterion groups for the purpose of cross-validating items. Group 1 consisted of 707 men with 62 persons classified as Type A-1, 338 as Type A-2, 241 as Type B-3, and 66 as Type B-4. Again, each item was tested for its ability to discriminate between the four groups with particular attention paid to discrimination between the two Type A groups as opposed to the two Type B groups. This was the initial validation of the 21 new items.

A total of 82 responses contained in 39 questions discriminated between the behavior type groups at or beyond the 0.05 level of statistical significance. Some of the responses were endorsed significantly more often by Type A men than all other types and thus

were collectively called the "A-1 scale." Another group of responses which were significantly checked most frequently by Type B-4 men constituted the "B-4 scale."

Although the authors of the test preferred to use a discriminant function procedure to combine items into scales, at the time they felt this was not possible due to mathematical and computational problems associated with categorical and non-independent variables. Therefore, a "unit scoring system" was employed in which a score of unity (1) was arbitrarily assigned for each response which was statistically distinctive to that particular behavior type group, and a score of zero (0) was assigned for the other responses to that question, including no answer. Thus, only one response of the 2 to 5 alternatives per question was scored.

In order to determine if age would affect the responses of the participants, a sample of 160 men were selected with half between the ages of 40 and 49 and half between 50 and 59 (Jenkins et al., 1967). Within the two age groups, 20 men were assigned to each of the four behavior type classifications. None of the 61 items showed a significant difference in response selection between the two age groups at the 0.05 level, when the Kolmogorov-Smirnoff test for two matched samples was employed. This suggests that age differences in men between 40 and 60 years old does not significantly influence JAS responses (Jenkins et al., 1967).

In 1965, the above described questionnaire was administered to participants in the WCGS who had not previously been included in the

validation procedure. Group means and standard deviations were computed for the four scales which revealed that each of the four scales discriminated at $p < 0.00001$. To determine how effectively the JAS correctly identified individuals, the results of the JAS were cross-validated with subjects from the WCGS. The overall rate of agreement between the JAS and the SI ratings of participants at intake and in 1962 was 72.4 percent (Jenkins et al., 1967; Jenkins, 1978).

To determine if the Type A behavior pattern as identified by the JAS was a single syndrome or an aggregation of traits, factor analyses were conducted on the 39 items, of the 61-item questionnaire, which had been found to discriminate between the behavior type groups (Zyzanski & Jenkins, 1970). The tetrachoric coefficient was used in the initial factor analysis of the data; however, solutions were found to have negative roots and factor loadings greater than unity when the subsamples were factor analyzed. Therefore, the phi coefficient was used with the inter-correlation matrix of the 39 items formed by selecting the alternative within each item which maximized the correlation of that item with the remaining items in the pool. The selected alternative was assigned a score of unity (1) with the remaining alternatives assigned a score of zero (0). A principal axes factor solution of the reduced correlation matrix was obtained with the latent roots greater than 0.8 of the correlation matrix extracted and then selected axes were rotated according to the varimax criterion. The criteria used in determining the number of varimax rotated axes to retain included: those axes with latent roots

greater than 1.0; those whose variables had a multiple correlation with the factor of 0.50 or more; those with a significant percentage of the total variance accounted for; and consideration of sharp breaks in the magnitude of the ordered unrotated latent roots when plotted (Zyzanski & Jenkins, 1970).

The remaining 22 items of the 1965 edition of the JAS were added to the matrix to determine if any of these items would be helpful in defining the factors obtained. The initial sample of 707 men were then divided into two groups, Type A and Type B, as determined by the SI at intake and in 1962. Factor analyses performed on the total matrix of 61 items both for the entire sample of 707 men and for each Behavior Type group did not change the basic dimensions found in the initial analysis.

In addition to the Type A behavior pattern, factor analyses identified three factorially independent components. These components were labeled: Speed and Impatience, which deals with time urgency and irritability threshold; Job Involvement, which reflects the degree of demands and dedication to occupational activity; and Hard-Driving, which reflects how a person perceives himself with regard to being hard-driving, competitive and serious (Jenkins et al., 1974). Factor analyses revealed that the factor structures in all instances were stable over different numbers of rotations in the varimax solution.

To determine the validity of these results, cross-validation in a sample of 984 men comprising Group 2, was undertaken. This cross-validation was performed by employing a discriminant analysis between

the criterion groups (Type As and Type Bs defined by the SI) (Jenkins, 1978). A 19-item discriminant function equation was found to best predict Type A behavior and was cross-validated on an independent sample of 419 men who comprised Group 3 (Jenkins, Zyzanski & Rosenman, 1979). Results revealed that the 1965 JAS, in its final standardization, predicted the SI ratings 73 percent of the time for the entire third cross-validation sample. In addition, there was 90 percent agreement between the SI and the JAS for persons scoring one standard deviation away from the mean on the JAS (Jenkins, 1978).

In 1966, a second edition of the JAS was printed which included all items that appeared in the discriminant function equation for Type A in 1965 and the salient items which defined the three other factors. Some items were dropped and new items added based on clinical and psychometric experience, giving a total of 57 items on the 1966 edition of the JAS. These 57 items were administered to the entire WCGS population and those men determined to be clearly Type A or Type B according to the SI were again assigned to one of three groups (an initial validation group and 2 cross-validation groups). The 57 items comprising the 1966 edition of the JAS underwent the same validation and cross-validation procedures employed on the 1965 edition of the JAS. In spite of some differences in item sequence, optimal scaling and discriminant function weights, the test-retest correlations between the 1965 JAS and the new form were in the range of .60 and .70. This is comparable to the range observed for the

MMPI, the scales of the Wechsler-Bellevue test, serum cholesterol and blood pressure measured at one-year intervals (Jenkins, 1978).

Other editions of the JAS have since been published. In 1969, a third edition of the JAS was constructed and administered to the WCGS population. However, as nine years had elapsed since the SI intake had been conducted, the 1965 and 1966 JAS scores were used for criteria rather than the SI ratings.

Form B of the JAS was constructed in 1972 to be used by both men and women. It was composed of all items on the 1969 edition of the JAS that appeared on the discriminant function scales for Type A behavior and the three independent factors. All other items were eliminated from the pool. In addition, questions were reworded to eliminate gender references, and sports activities in college references were broadened to include all extracurricular activities. While Form B was expanded to include women, it contained many items that were appropriate only to those persons regularly employed in a salaried job. The numerous studies using the JAS have indicated the JAS does not significantly correlate with most standard coronary heart disease risk factors and thus is an independent contributor to the prediction of coronary heart disease risk (Jenkins, 1978).

Framingham Heart Study

While the WCGS was being conducted on the West Coast and involved an all male population, another prospective study was being conducted which included both men and women. The Framingham Heart

Study, which spanned a 12 year follow-up period, included 2200 men and 2800 women initially free of coronary heart disease (Haynes, Levine, Scotch, Feinleib & Kannel, 1978). Begun in 1949, the study involved numerous physiological tests and biennial checkups for the 5000 participants.

In 1965, a 300-item questionnaire was developed to assess the role psychosocial stress played in the development of coronary heart disease. The five areas of information covered in the questionnaire included socio-demographic situations, life events, behavior types, situational stress, and somatic strain. Questions generally required either yes-no type answers or a response along a four-point scale indicating which response was most true of that person. The questionnaire took approximately 45 minutes to complete and was administered by interviewers. Analysis of the information was based solely on the content of the responses.

The population studied consisted of over 3000 men and women aged 45 to 77 years who were free of coronary heart disease at their 8th and 9th biennial medical examinations. A pretest version of the questionnaire was administered to 670 members of this group and several items were dropped and new ones added. Of the remaining participants, approximately nine percent were excluded due to their inability to complete the questionnaire for various reasons and approximately 16 percent were excluded from the analysis due to interviewer bias on the part of one interviewer. The final sample was composed of over 1800 people.

From the 300 questions, 20 scales were developed on the basis of three outside experts' opinions as to which items they believed measured the behavioral patterns initially conceptualized in the design of the questionnaire. These patterns included Type A behavior, anxiety, and an "anger in/anger out" concept as well as others. The pooled list of items was subjected to item and factor analysis, with items having poor inter-item correlations ($r < .15$) and/or low factor loadings dropped. The remaining items were summed and the correlation between each item and the total score, minus that item, was calculated. Items obtaining correlation coefficients of less than .25 were dropped from each scale.

A measure of internal consistency was calculated for each scale using the formula proposed by Nunnally (cited in Haynes et al., 1978) with values ranging from .51 to .86 obtained for 13 of the scales. As the questionnaire contained items which required different types of answers, i.e., multiple choice as well as yes-no answers, the scales were scored by summing the responses to each question, with a score of 1 being assigned to an answer indicating complete presence of a trait, and a score of 0 for the complete absence of the trait, then dividing by the number of questions.

Framingham Type A Behavior Scale

A 10-item Framingham Type A behavior scale was developed for use with both men and women, with a slight modification made in some of the questions for administration to housewives. For working men and

women, the questions were the same. The reliability coefficient for Framingham Type A men was .71 and .70 for Framingham Type A women. In addition, the scale was significantly correlated with other scales including: ambitiousness (.31), emotional lability (.43), tension (.42), daily stress (.47), and anger symptoms (.34). There was also a positive correlation with educational level (.10) and occupational status (.22). As the Framingham Type A scale was generally unrelated to individual physiological components of coronary heart disease risk factors, it appears to be a valid scale.

Although the Framingham Type A scale achieved empirical and face validity, studies were undertaken to compare the Framingham Type A scale with the Structured Interview of Friedman and Rosenman (Haynes, Feinleib & Kannel, 1980). The Framingham questions achieved approximately a 60 percent agreement with the SI, whereas the Jenkins Activity Survey agrees with the SI 63 to 73 percent of the time (see Haynes et al., 1980, for more information). However, the Framingham scale was not originally developed or intended to measure Type A behavior as defined by the SI, as the JAS was.

Other methods for assessing Type A behavior have since been developed including the Short Rating Scale (Bortner, 1969); the Performance Battery (Bortner & Rosenman, 1967); and various speech stylistics methods (Friedman, Brown & Rosenman, 1969; Schucker & Jacobs, 1977; Sherwitz, Berton & Leventhal, 1977). In addition, a student version of the JAS was developed (Glass, 1977; Krantz, Glass & Snyder, 1974). However, a study conducted by MacDougall, Dembroski

and Musante in 1978 using the student version of the JAS as well as the Framingham scale, the SI and the Gough and Thurstone inventories found the student JAS correlated relatively weakly with the SI in assessing Type A behavior in male and female college students, whereas the Framingham scale correlated with the SI appreciably greater for females than for males.

Although various other methods have been developed to assess the Type A behavior pattern, the two most commonly used methods are the Structured Interview and the Jenkins Activity Survey, including the one developed by Glass. However, because the JAS does not appear to be as strong an instrument as the SI, numerous studies have been conducted to investigate this problem.

One such study by Herman, Blumenthal, Black and Chesney (1981) was conducted to determine if, and in what respects, Type A individuals are able to perceive Type A behavior in themselves. Three hundred and seventy-eight male white-collar workers were classified as being Type A or Type B on the basis of a Structured Interview. In addition, subjects were administered a battery of psychological tests including the Gough Adjective Checklist. The Checklist had previously been rated by 20 research scientists to determine which adjectives they believed were characteristic of a typical Type A individual and which were untypical of Type As (see Herman et al., 1981, for more information).

Results indicate there was a linear relationship between self-ratings of Type A characteristics and the interview based

classification. In general, the Type A individual's self-perception was congruent with the personality traits attributed to Type As by researchers in the field. Type As tended to see themselves as assertive, aggressive, outgoing, energetic and autonomous. However, they tended not to see themselves as having more negative or less socially desirable characteristics such as being hostile, driven or egocentric. In addition, several Type B responses were identified which were endorsed differentially by Type As and Type Bs. These items included the traits "calm," "quiet," "cautious," "mild," "peaceable," "silent," "slow," and "easy-going." While the lack of endorsement of less socially desirable traits may suggest Type A individuals are unaware they possess these traits, it also may be reflective of their trying to appear in a more socially desirable light.

In addition to using the Gough Adjective Checklist, other researchers have used such measures as the Minnesota Multiphasic Personality Inventory (MMPI) (Glass, 1977), the Texas Social Behavior Inventory (Glass, 1977), the EASI Temperament Survey (Glass, 1977), and the California Psychological Inventory (Motiff & Palladino, Note 1). While many of the results showed significant differences between Type A and Type B individuals, the studies have not undergone replications to determine how stable their results were.

While research into the relationship between Type A behavior and coronary heart disease continues, other areas of investigation concerning Type A behavior include the behavior pattern's

relationship to: competitive drive (Matthews, Glass, Rosenman & Bortner, 1977), field dependence (McCranie, Simpson & Stevens, 1981), fear of failure (Gastorf & Teevan, 1980), sense of time urgency (Gastorf, 1980), social facilitation (Gastorf, Suls & Sanders, 1980), attribution of illness (Gastorf, Note 2), work load and depression (Brief, Rude & Rabinowitz, 1981), allocation of attention (Matthews & Brunson, 1979), and coping and defense mechanisms (Vickers, Hervig, Rahe & Rosenman, 1981). While this list is by no means extensive, it is representative of the diverse areas now being investigated with regard to Type A behavior.

Numerous literature reviews of the studies done investigating Type A behavior and coronary heart disease have been conducted by various researchers in the field (Brand, 1978; Jenkins, 1976; Sparacino, 1979; Zyzanski, 1978). Jenkins (1976) in reviewing over 88 studies noted that both prospective and retrospective studies conducted between 1970 and 1975 support earlier research that reported a higher risk of coronary heart disease in persons manifesting Type A behavior. In addition, both from studies he reviewed and his own investigations, Jenkins observed that Type A behavior was a consistent style of behavior exhibited by some persons in response to circumstances that arouse them, rather than being a distress response. Glass (1977), from his numerous studies, postulated the Type A individual as being in a constant struggle to maintain control over his environment. While a cause and effect relationship between Type A behavior and coronary heart disease has not been established, it

has been repeatedly shown through numerous research studies the ability of the Type A behavior pattern to predict the eventual development of coronary heart disease, especially in predominantly white, middle-class males in the United States (Sparacino, 1979).

In addition, a study conducted in Belgium involving over 18,000 workers employed in 30 factories was undertaken to investigate the incidence of coronary heart disease in that population and the ability of the Structured Interview and Jenkins Activity Survey to assess Type A behavior in such a population (Kittel, Kornitzer, Zyzanski, Jenkins, Rustin & Degre, 1978). The population studied consisted of men between the ages of 40 and 59, employed as executives, white-collar workers and workmen. Results of the study indicated that although the Structured Interview and the Jenkins Activity Survey underwent translation from English to French and Flemish in order to be administered to this population, there was a 70 percent agreement rate between the Structured Interview and the Jenkins Activity Survey. This suggests that the concept of a Type A behavior pattern has cross-cultural validity, at least for industrialized European countries. In addition, the Structured Interview and Jenkins Activity Survey appear to be robust instruments and their concepts of Type A behavior pattern clear enough to be validly translated into other languages and still yield reliable measurements (Kittel et al., 1978; Kornitzer, Kittel, DeBacker & Dramaix, 1981).

Research in the area of coronary heart disease has undergone remarkable changes in techniques and methodology during the past

several decades. From retrospective studies utilizing primarily physiologic measures to assess coronary heart disease, research has expanded to include prospective studies and the use of psychological and behavioral assessment techniques as well as socioeconomic data and physiological measures.

Because of the trend now in research to use several assessment techniques during a given study, instruments that are valid and reliable but require little time to administer and can be given to large groups of people at a time, are required. Although the Structured Interview may now be conducted in as little time as ten minutes, it still requires an interviewer who is trained to assess one person at a time. The Bortner Performance Battery, the Framingham Type A behavior scale and the various speech stylistics assessment methods all involve assessing one subject at a time through the use of an interviewer. Various paper and pencil tests such as the Jenkins Activity Survey take approximately 20 minutes to complete and while the Short Rating Scale by Bortner requires little time to take, it has not been used extensively in research.

The purpose of the present study is to evaluate the ability of a 6-item "questionnaire" to identify the Type A behavior pattern in individuals. If validity and reliability for the instrument can be established, then it could be used in research as a more efficient means of measuring Type A behavior than the time-consuming Structured Interview or Jenkins Activity Survey. Not only would the 6-item "questionnaire" save time, but the cost of administering and scoring it would be minimal.

METHOD

Subjects

Participants were a class of 243 introductory psychology students at the University of Wisconsin-Oshkosh. To meet the requirements of the professor teaching the class, all students participated, with 150 students receiving two questionnaires to complete and 93 students receiving one questionnaire.

While all students received the same amount of credit for their participation, only data collected from students completing two questionnaires were used for analyses in this study, as information from both questionnaires was necessary. (Due to cost constraints, only 150 copies of one of the questionnaires could be purchased for the study.) Of these 150 students, ages ranged from 17 to 39 years with a mean age of 19.4 years and a standard deviation of 3.19.

Instruments

A Six-item Health Administrators Questionnaire (see Appendix A) was administered to determine its validity in differentiating Type A individuals from Type B. The six items are from a larger questionnaire which contained 175 items and was administered to 314 Mental Health Administrators working in Wisconsin, Michigan and Minnesota. Test for internal consistency with the six items was below .70. However, when

the question "I eat rapidly" was deleted, a test for internal consistency for the remaining five items was .78. The six items were answered along a five-point scale indicating to what degree a statement was true of the person and were assigned weights ranging from 1 for items marked "to a very great extent" to 0 for those marked "not at all." A weight of .75 was assigned for those items marked "to a great extent," .50 for those indicating "to some extent," and .25 for those endorsed "to a small extent." The weights were summed and multiplied by 1.67 to put the scale on the same metric with the ten items on the Framingham Scale. (However, this did not affect other analyses as scores were multiplied by a constant.) The six items appeared on the questionnaire as items 1 through 6 with the Framingham Type A Behavior Pattern Scale appearing on the same questionnaire as items 7 through 16.

The Framingham Type A Behavior Pattern Scale (see Appendix A) consisted of ten self-descriptive items. Five of these items were responded to along a four-point scale indicating to what degree the statement described the person and weights were assigned ranging from 1 for "very well" to 0 for "not at all." Items endorsed "fairly well" received a weight of .67 and those marked "somewhat" a weight of .33. The five items requiring a "yes" or "no" answer were given weights of 1 for indicating total presence of a trait and 0 for total absence of a trait (MacDougall et al., 1979; Haynes, Note 3).

The Jenkins Activity Survey Form C (fifth edition) (Jenkins, Zyzanski & Rosenman, 1979) had 52 items answered on one to four scales.

The scales were: (a) Type A which consisted of 21 items; (b) Speed and Impatience which consisted of 21 items; (c) Job Involvement, consisting of 24 items; and (d) Hard-Driving and Competitive which consisted of 20 items. The four scales were constructed to have a mean of 0.0 and a standard deviation of 10.0. Scores greater than zero indicate Type A behavior, while scores less than zero indicate Type B behavior. However, the JAS classification is more valid when ±.5 standard deviation is employed rather than a simple median split (MacDougall et al., 1979). A different weight was assigned for each item on the four scales, with weights also being given for items left blank (Jenkins Activity Survey, Note 4). Weights for each of the scales included both positive and negative numbers and ranged from +67 to -42. Weights were then summed yielding a raw score for each of the four scales for each student. The raw scores were then converted to standard scores.

Procedure

Agreement to use an undergraduate class was reached with the provision all students be allowed to participate in the project. Questionnaires were administered to the class as a group, during the last 30 minutes of class. A description of the project read to the class may be found in Appendix B.

Two different sets of questionnaires were used in the study. One set consisted of the Jenkins Activity Survey, the Six-item Health Administrators Questionnaire and the Framingham Type A Behavior

Pattern Scale and comprised 150 of the questionnaire packets. The second set was composed of the Six-item Health Administrators Questionnaire and the Framingham Type A Behavior Pattern Scale only. These latter two questionnaires were printed to appear as one questionnaire rather than two separate ones.

Students were randomly handed questionnaire packets containing either one or two questionnaires. All the packets had been numerically coded with packets containing two questionnaires having duplicate numbers printed on each questionnaire in the event the two became separated following completion by the students. Students receiving packets with two questionnaires answered the questionnaires in the order they chose, as they were not given instructions as to which questionnaire to answer first. Participants receiving the JAS were asked to indicate their age and sex. Sheets of paper were provided for the students to list their name and address if they wished to receive results of the study.

All American Psychological Association and university human subjects ethical guidelines for research were followed.

RESULTS

Of the 150 questionnaire packets distributed, five were returned with all the questions unanswered, five were not returned and four were incomplete. The final analyses were based on 136 questionnaire packets, or 90.7% of the questionnaires distributed. Ninety-two females and 44 males participated in the study.

The standard scores for the four JAS scales, and the weighted scores for the Framingham and the Six-item Questionnaire were summed for each scale yielding totals for the six scales. Discriminant analysis on the six scales was conducted according to sex which yielded a non-significant Chi-Square ($x^2 = 3.27$) indicating no overall differences on scale scores due to students' sex. Means and standard deviations were computed for the six scales, with negative means on the four JAS scales indicating Type B behavior (see Table 1).

Three 6 x 6 Pearson Product Moment Correlations (r) were computed according to the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975), one for males (see Table 2), one for females (see Table 3) and one for all the students (see Table 4), with the six scales as variables. All six scales were found to correlate positively and significantly with each other for all students, females, and males, with exception of a negative correlation of -.10 between the Speed and Impatience Scale and Hard-Driving Scale for males.

TABLE 1

MEANS AND STANDARD DEVIATIONS FOR THE SIX SCALES

Variable	n[a]	Mean	Standard Deviation
Type A Scale	136	- .42	8.45
Speed & Impatience	136	- .46	8.92
Job Involvement	136	-2.81	7.89
Hard-Driving	136	-4.80	8.83
Framingham	136	4.99	1.93
Six-item Questionnaire	136	5.39	1.34

n[a] = the number of students for which data was available.

Note: Negative means on JAS scales indicate Type B behavior.

TABLE 2

CORRELATION OF THE SIX SCALES FOR MALES

Variable	1	2	3	4	5	6
Type A Scale	1.00	.46**	.39**	.50***	.34*	.58***
Speed & Impatience		1.00	.01	-.10	.54***	.53***
Job Involvement			1.00	.29	.14	.24
Hard-Driving				1.00	.15	.32*
Framingham Scale					1.00	.58***
Six-item Questionnaire						1.00

Note: Number of males = 44.

*p < .01

**p < .005

***p < .0001

TABLE 3

CORRELATION OF THE SIX SCALES FOR FEMALES

Variable	1	2	3	4	5	6
Type A Scale	1.00	.56***	.13	.55***	.48***	.56***
Speed & Impatience		1.00	.10	.17	.53***	.57***
Job Involvement			1.00	.17	.16	.25**
Hard-Driving				1.00	.39***	.48***
Framingham Scale					1.00	.50***
Six-item Questionnaire						1.00

Note: Number of females = 92.

*p < .01

**p < .005

***p < .0001

TABLE 4

CORRELATION OF THE SIX SCALES FOR ALL STUDENTS

Variable	1	2	3	4	5	6
Type A Scale	1.00	.53***	.21**	.53***	.44***	.56***
Speed & Impatience		1.00	.07	.08	.53***	.56***
Job Involvement			1.00	.20**	.16*	.24**
Hard-Driving				1.00	.32***	.43***
Framingham Scale					1.00	.52***
Six-item Questionnaire						1.00

Note: Number of students = 156.

*p < .01

**p < .005

***p < .0001

In order to average correlations, z scores were computed by converting the correlations for each scale to z scores (McCall, 1975), summing the z scores for each of the six scales, then dividing each of the totals by 5 to get an average z score for each scale. Average z scores were converted to average rs based upon the transformation table. The following are the average correlations of each of the scales with all the remaining scales: Type A (r = .46), Speed and Impatience (r = .38), Job Involvement (r = .18), Hard-Driving (r = .32), Framingham (r = .40), and Six-item (r = .47).

T-tests were computed between correlations on the six scales for males and females (see Table 5) with all non-significant at the .05 level (t = ±1.96). Thus, while females in general obtained higher correlations on the various scales, their correlations were not significantly greater than correlations for males.

TABLE 5

T-TESTS ON CORRELATIONS FOR MALES AND FEMALES

Variable	1	2	3	4	5	6
Type A Scale		.721	-1.489	.366	.896	-0.154
Speed & Impatience			.477	1.441	-0.074	.307
Job Involvement				-0.673	.106	.053
Hard-Driving					1.383	1.012
Framingham Scale						-0.599
Six-item Questionnaire						

Note: All tests non-significant at .05 level with $t = \pm 1.960$.

DISCUSSION

Results indicated the Six-item Health Administrators Questionnaire correlates positively and significantly with the four scales of the Jenkins Activity Survey and the Framingham Type A Behavior Pattern Scale. However, correlations between all scales were below 0.60.

Overall, the Six-item Questionnaire correlated higher with the other scales than either the Framingham or the JAS Type A Scale, which suggests that at least in this test population the Six-item Questionnaire is as strong an instrument for measuring Type A Behavior as the Framingham or the JAS Type A Scale. As order of instrument presentation was not balanced, higher correlations for the Six-item Questionnaire could indicate the students were more alert and fresh when they took the Six-item Questionnaire. In general, correlations between all six scales were higher for females than males; however, analyses indicated overall these differences were not significant, suggesting sex does not make a difference.

Females generally had higher correlations between the Framingham and the other scales, which tends to support the findings of previous researchers (MacDougall et al., 1979). However, males did have a higher correlation between the Framingham and the Six-item Questionnaire, although the significance levels were the same for both

groups. There was a negative correlation between the Speed and Impatience Scale and the Hard Driving and Competitive Scale for males, suggesting an inverse relationship between the two scales in this male population.

Inspection of the means and standard deviations for the four Jenkins Activity Survey Scales revealed negative means for the four scales as well as a great deal of variability within each Scale. This suggests the students as a group tended to endorse items indicative of Type B behavior rather than Type A. However, the great amount of variability within each scale of the JAS suggests there were students at each end of the Type A - Type B continuum. This research study did not examine classification of the students by behavior types. Comparison of results of this study to other research studies would probably not be meaningful as participants were not preselected according to behavior types as in previous studies.

Previous research in the area of validating instruments for use in determining Type A behavior traits in individuals have used a different research design than the one used here. Subjects have typically been classified as Type A or Type B based upon the use of the Structured Interview or the Jenkins Activity Survey. They are then given the instrument being validated and their scores on the experimental instrument are then compared to scores received on the classification instrument. Correlations are then computed based upon this data. As it was not within the scope of this research study to conduct the project in the above manner, classification of the

students according to behavior types was not possible.

It may have been interesting to determine how many college-aged students perceived themselves as possessing extreme Type A behavior traits. Research with white-collar workers (Herman et al., 1981) has shown that while the subjects were able to perceive Type A behavior in themselves, they tended to endorse those items that had a more positive connotation and not endorse Type A behavior traits having a more negative connotation.

While correlations between the Six-item Health Administrators Questionnaire and the Framingham Type A Behavior Pattern Scale and the four scales of the Jenkins Activity Survey show much variance not accounted for, it may still be useful as a gross screening device for Type A behavior in situations where various aspects of personality are being examined and several instruments of measurement are being utilized.

APPENDIX A

Instructions:

Please answer all questions.
Please circle the letter next to the alternative which most closely describes you.

1. I PUT A LOT OF EFFORT INTO THINGS.

   a. not at all
   b. to a small extent
   c. to some extent
   d. to a great extent
   e. to a very great extent

2. I AM AMBITIOUS.

   a. not at all
   b. to a small extent
   c. to some extent
   d. to a great extent
   e. to a very great extent

3. I AM IN A HURRY.

   a. not at all
   b. to a small extent
   c. to some extent
   d. to a great extent
   e. to a very great extent

4. I EAT RAPIDLY.

   a. not at all
   b. to a small extent
   c. to some extent
   d. to a great extent
   e. to a very great extent

5. I AM HARD-DRIVING.

a. not at all
b. to a small extent
c. to some extent
d. to a great extent
e. to a very great extent

6. I DO MORE THAN ONE THING AT A TIME.

a. not at all
b. to a small extent
c. to some extent
d. to a great extent
e. to a very great extent

TRAITS AND QUALITIES WHICH DESCRIBE YOU:

7. BEING HARD-DRIVING AND COMPETITIVE.

a. very well
b. fairly well
c. somewhat
d. not at all

8. USUALLY PRESSED FOR TIME.

a. very well
b. fairly well
c. somewhat
d. not at all

9. BEING BOSSY OR DOMINATING.

a. very well
b. fairly well
c. somewhat
d. not at all

10. HAVING A STRONG NEED TO EXCEL IN MOST THINGS.

a. very well
b. fairly well
c. somewhat
d. not at all

11. EATING TOO QUICKLY.

a. very well
b. fairly well
c. somewhat
d. not at all

FEELING AT THE END OF AN AVERAGE DAY OF WORK:

12. OFTEN FELT VERY PRESSED FOR TIME.

a. yes
b. no

13. WORK STAYED WITH YOU SO YOU WERE THINKING ABOUT IT AFTER WORKING HOURS.

a. yes
b. no

14. WORK OFTEN STRETCHED YOU TO THE VERY LIMITS OF YOUR ENERGY AND CAPACITY.

a. yes
b. no

15. OFTEN FELT UNCERTAIN, UNCOMFORTABLE, OR DISSATISFIED WITH HOW WELL YOU WERE DOING.

a. yes
b. no

16. DO YOU GET UPSET WHEN YOU HAVE TO WAIT FOR ANYTHING?

a. yes
b. no

APPENDIX B

My name is Beverly Lenahan and I am a graduate student in Clinical Psychology here at the University. In order to fulfill one of the requirements necessary for me to graduate, I am conducting a validity study to determine how various instruments used to assess personality variables compare with each other.

Some of you students will be asked to complete <u>two</u> questionnaires while others will be asked to complete just one questionnaire. This is to meet both the requirements for my thesis project and to meet your professor's requirements. All students will receive the same amount of credit regardless how many questionnaires they fill out.

You have the right to refuse participation in this project if you so choose. If you decide you would like to participate in this research project, you have the right to receive information concerning the results of this study. If you would like to know the results of this study, please sign your name and address on the sheet of paper here on the table, when you turn in your questionnaires. This information will be used to contact you in order to give you feedback concerning the results of the study and for no other reason. The questionnaires are to be filled out indicating only your age and sex and <u>not</u> your name or student identification number.

If there is anyone who would prefer not to participate in this research project, you may leave the room.

Thank you for participating in this project.

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